

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-6 (Canceled).

Claim 7 (New): A method for extracting hydrogen from a gas that contains methane comprising:

catalytically splitting hydrocarbons contained in the gas into hydrogen, carbon monoxide, and carbon dioxide in a reformer, by means of steam;

performing catalytic conversion of the carbon monoxide that was formed to carbon dioxide and hydrogen in a subsequent conversion stage, with steam;

removing the carbon dioxide after the step of catalytic conversion by means of a gas scrubber;

subsequently separating the remaining gas stream into a product gas stream that consists of hydrogen, and a waste gas stream, in a pressure swing adsorption system;

passing the entire waste gas stream to a combustion

chamber of the reformer, together with a partial hydrogen stream that is branched off from the gas behind the gas scrubber, as a combustion gas that is extensively free of carbon, and

burning the waste gas stream and hydrogen in the reformer;

wherein the amount of the partial hydrogen stream is adjusted to that the partial hydrogen stream meets an energy demand of the reformer during common combustion with the waste gas stream.

Claim 8 (New): The method according to claim 7, wherein a conversion reactor operating at temperatures between 360 and 500°C and a subsequent conversion reactor operating at temperatures between 210 and 270°C are used for the conversion stage.

Claim 9 (New): The method according to claim 1, wherein the carbon dioxide separated in the gas scrubber is used for technical applications or processed further to produce a product having a quality that can be used in the foods industry.

Claim 10 (New): A system for extracting hydrogen from a gas that contains methane comprising:

at least one reformer having a combustion chamber for catalytic splitting of gaseous hydrocarbons with steam;

a conversion stage having at least one conversion reactor for catalytic conversion of carbon monoxide to carbon dioxide and hydrogen, with steam;

a gas scrubber for separating carbon dioxide from the gas stream that leaves the conversion stage; and

a subsequent pressure swing absorption system for isolating hydrogen, to which a gas line that is passed back to the combustion chamber is connected, for firing the reformer with a gas stream that exits from the adsorption system,

wherein an additional device is provided for passing back part of the hydrogen-rich gas stream that leaves the gas scrubber into the combustion chamber of the reformer.

Claim 11 (New): The system according to claim 10, wherein the conversion stage comprises a conversion reactor operating at temperatures between 360 and 500°C and a subsequent conversion reactor operating at temperatures between 210 and 270°C.

Claim 12 (New): The system according to claim 10, further comprising a purification stage for concentrating the separated carbon dioxide after the carbon dioxide exits the gas scrubber.